

NIKITIN, Lev Ivanovich; GALEYEV, Valentin Sergeyevich; PENTEL'KOV, Grigoriy Ivanovich; NEMTSEV, P.F., red.

[Labor protection in the woodworking industries; manual for foremen] Okhrana truda v derevoobrabatyvaiushchei promyshlennosti; posobie dlia masterov. Moskva, Izd-vo "Lesnaia promyshlennost'," 1964. 135 p. (MIRA 17:6)

PENTESHINA, U.A.

Morphology of the pterygopalatine ganglion. Zhur. nevr. i psikh.  
65 no.9:1325-1330 '65. (MIRA 13:9)

1. Kafedra operativnoy khirurgii i topograficheskoy anatomii  
Petrozavodskogo universiteta im. Kuusinenena.

LITVER, G.M., PENTESHINA, N.A.

Specificity of total regeneration of skeletal muscles in various mammal species. Biul.eksp.biol. i med. 55 no.1: 88-92 Ja'63. (MIRA 16:7)

1. Iz kafedry obshchey biologii (zav. - prof. G.M.Litver) i kafedry operativnoy khirurgii (zav. -prof. M.A Sreseli) I Leningradskogo meditsinskogo instituta imeni I.P.Pavlova. Predstavlena deystvitel'nyy chlenom AMN SSSR A.V.Lebedinskim.  
(REGENERATION (BIOLOGY)) (MUSCLES)  
(MAMMALS--PHYSIOLOGY)

PENTESHINA, N.A.

Diploetic veins of the roof of the skull. Trudy LMI 2:48-54 '55  
(MIRA 11:8)

1. Kafedra operativnoy khirurgii i topograficheskoy anatomii  
(sav. - prof. M.A. Sreseli) Pervogo Leningradskogo meditsinskogo  
instituta imeni akademika I.P. Pavlova.  
(SKULL--BLOOD SUPPLY)

PENTESHINA, N.A. (Leningrad, 106, Gavanskaya ul., d.2-b, kv.11)

Topography and structural features of the submaxillary ganglia.  
Arkhnat.gist. i embr. 35 no.3:73-75 My-Je '58 (MIRA 11:7)

1. Kafedra operativnoy khirurgii i topograficheskoy anatomii  
(zav. - prof. M.A. Sreseli) Leningradskogo meditsinskogo instituta  
im. akademika I.P. Pavlova.

(GANGLIA, anat. & histol.  
submaxillary (Rus))

PENTIN, A.P.; NIKOLAYEV, G.V.

Condition and vitality of the pine plantations subjected to the  
tapping using calcium hypochlorite. Gidroliz. 1 lesokhim. prom. 11  
no.6:25 '58. (MIRA 11:10)

1.Ger'kovskoye oblastnoye upravleniye sel'skogo khozyaystva.  
(Tree tapping)

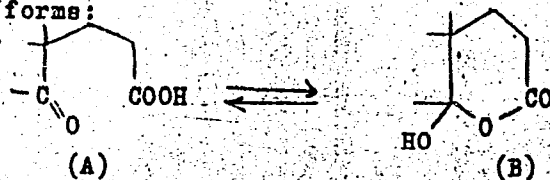
S/048/63/027/001/020/043  
B106/B101

AUTHORS: Pentin, Yu. A., Trubnikov, I. S., Teplinskaya, R. B., Shushetina, N. P., and Levina, R. Ya.

TITLE: Infrared spectra and the structure of  $\delta$ -keto acids

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 27, no. 1, 1963, 55-58

TEXT: IR spectra were taken in order to study the structures of five liquid and some crystalline  $\delta$ -keto acids which, according to J. Cason and E.J. Reist (J.Organ.Chem., 23, 1675 (1958)), may exist in two tautomeric forms:



Spectrum analyses in the  $3600 - 2000 \text{ cm}^{-1}$  region (stretching vibrations

Card 1/3

Infrared spectra and the ...

S/048/63/027/001/020/043  
B106/B101

of OH of the carboxyl group at  $3200 - 3000 \text{ cm}^{-1}$ ) and  $1800 - 700 \text{ cm}^{-1}$  region (characteristic absorption bands of the carboxyl group) showed liquid and crystalline  $\delta$ -keto acids to exist in the open-chain keto structure A, since an absorption characteristic of the lactole form (at  $\sim 3200 \text{ cm}^{-1}$ ) was not observed. Liquid  $\delta$ -keto acids (e.g.  $\text{CH}_3\text{COCH}(\text{i-C}_3\text{H}_7)\text{CH}_2\text{CH}_2\text{COOH}$ ) are associated. A study of mixtures of a  $\delta$ -keto acid with acetophenone-o-carboxylic acid having lactole structure showed that this structure becomes noticeable at a 3% content and clearly visible at 5% by an intensive  $3300 \text{ cm}^{-1}$  band. In a solution of carbon tetrachloride or chloroform the  $\delta$ -keto acids ( $\gamma$ -acetyl butyric acid,  $\gamma$ -benzoyl butyric acid,  $\gamma$ -benzoyl pelargonic acid) as well as  $\gamma$ -keto acids (levulinic acid,  $\beta$ -benzoyl propionic acid) occur in the open-chain form, since there is no absorption either in the  $3400 - 3200 \text{ cm}^{-1}$  or in the  $3600 - 3550 \text{ cm}^{-1}$  regions (stretching vibrations of OH of the hydroxylactone form of keto acids). In concentrated solutions,  $\delta$ -keto acids are dimerized; the content of the monomeric form increases as the concentration decreases. There are 2 figures.

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Card 3/3

YU. A. FENTIN

③

Chemical structure of hydrocarbons and the regularities in the heats of combustion of liquid alkanes and alkylbenzenes. V. M. Tatovskii and Yu. A. Fentin. *Vestnik Moskov. Univ.* 8, Ser. Fiz.-Mat. i Estest. Nauk. No. 3, 69-72 (1953); cf. *C.A.* 45, 8360b; 46, 5906i. —Heats of combustion calcd. from the previously developed expression,  $-\Delta H = \Sigma n_i A_i$  agreed well with  $\Delta H$ 's detd. by expt. for liquid alkanes,  $C_n H_{2n+2}$ .  $\Delta H$  calcd. for 2,3-Me<sub>2</sub>C<sub>8</sub>H<sub>18</sub> and 2,2,4-Me<sub>3</sub>C<sub>8</sub>H<sub>18</sub> were higher, and those for 2,2,3,4-Me<sub>4</sub>C<sub>8</sub>H<sub>18</sub> and 2,2,4,4-Me<sub>4</sub>C<sub>8</sub>H<sub>18</sub> were lower, than the exptl. values. The reason for these exceptions could not be explained. G. Meguerian

10-13-54 I. J. P.

PENTIN, YU. A.

USSR/Physics - Isomerism

21 Mar 53

"Problem of Rotational Isomerism of 1,2-Dichloroethane and of 1,2-Dibromoethane," Yu. A. Pentin, Ya. S. Bobovich, D. B. Gurevich and V. M. Tatevskiy

DAN SSSR, Vol 89, No 3, pp 435-438

Detailed survey of subject was given by M. V. Volkenshteyn (cf. Usp. Khim. 13 (1944): "Oscillations of Molecules" 1949). Authors repeat experimental determination of energy isomerization of rotational isomers in liquid 1,2-dichloroethane and 1,2-dibromoethane using improved

272T75

photoelectric method for recording of spectra of combined scattering. Indebted to Prof. V. K. Prokof'yev and late Prof. A. V. Frost. Presented by Acad A. N. Terenin 14 Nov 52.

PENTIN, YU. A.

USSR/Chemistry

FD-774

Card 1/1 : Pub 129 11/24

Author : Tatevskiy, V. M.; Pentin, Yu. A.

Title : Chemical structure and regularities in the heats of combustion of liquid alkanes and alkyl benzenes

Periodical : Vest. Mosk. un., Ser. fizikomat. i yest. nauk, Vol 9, No 2, 81-84, Mar 1954

Abstract : Listed the experimental and calculated values for the heats of combustion of liquid alkanes and of alkyl benzenes. Three tables, Four references (all USSR).

Institution : Chair of Physical Chemistry

Submitted : September 17, 1953

TATEVSKIY, V.M.; PENTIN, Yu.A.

Chemical structure and rules in combustion temperatures of alkanes and alkyl benzenes. Vest. Mosk.un. 9 no.3:81-84 Mr '54. (MLRA 7:6)

1. Kafedra fizicheskoy khimii.  
(Alkyl benzenes)

USSR/Chemistry - Physical

FD-1677

Card 1/1 : Pub. 129-2/25

Author : Tatevskiy, V. M.; Pentin, Yu. A.

Title : Chemical structure and physicochemical properties of molecules

Periodical : Vest. Mosk. un Ser. fizikomat. 1 vest. nauk, Vol 10, 21-32, Feb 1955

Abstract : The physicochemical properties of a molecule are related to its structure. Molecules are arranged into classes which are determined by the position in the periodic table, bond angle, and other factors that affect the interatomic distances. The classes are further subdivided into types and the types into subtypes. Thus, hydrocarbon molecules were arranged systematically by structure and correlated with physicochemical properties such as molecular volume, refraction, heat of formation, etc. Ultimately, if the physicochemical properties and the proper constants are known, the structure of a molecule can be predicted. Large table; graphs. No references.

Institution : Chair of Physical Chemistry

Submitted : September 17, 1954

USSR/Chemistry - Physical

FD-2169

Card 1/1            Pub 129-9/20

Author            :    Pentin, Yu A., and Tatevskiy, V. M.

Title             :    ~~XXXXXXXXXX~~  
Infrared absorption spectra of certain alkyl halides and the question  
of rotational isomerism

Periodical        :    Vest. Mos. un., Ser. fizikomat. 1 yest, nauk, 10, No 2, 63-72, Mar 1955

Abstract          :    Obtained infrared absorption spectra in the region  $400-1500\text{ cm}^{-1}$  for  
propyl chloride, propyl bromide, isobutyl bromide, n-butyl bromide,  
isoamyl bromide, 1,2-dichloroethane, 1,2-dibromoethane, 1,2-dibro-  
mopropane, and 1,2-disbromobutane. Selected lines for investiga-  
ting the effects of temperature on relative line intensity and the  
determination of the relative stability of the rotational isomers  
of the above compounds. Graphs, formulas. Sixteen references  
(six USSR; fifteen since 1940)

Institution       :    Chair of Physical Chemistry

Submitted        :    October 20, 1954

PENTIN, YU. A.

FD-2170

USSR/Chemistry - Physical

Card 1/1 Pub 129-10/20

Author : Pentin, Yu. A., and Tatevskiy, V. M.

Title : ~~Energy differences and possible configuration of rotational isomers of certain alkyl halides~~  
Energy differences and possible configuration of rotational isomers of certain alkyl halides

Periodical : Vest. Mosk. un., Ser. fizikomat. i yest, nauk, 10, No 2, 73-82, Mar 1955

Abstract : Studied the effect of temperature (24-80 degrees) on the optical density of infrared absorption bands and calculated the energy differences of rotational isomers of gaseous propyl chloride and bromide, n-butyl and isoamyl bromides, 1,2-dichloro and 1,2-dibromoethane, and 1,2-dibromopropane. Also conjectured on the possible configurations of the rotational isomers of the above compounds and drew conclusions on their relative stability from determined factors. Tables, graphs, diagrams. Twelve references (six USSR; all since 1940).

Institution : Chair of Physical Chemistry

Submitted : October 20, 1954

*PENTIN, Yu. A.*  
USSR/Physical Chemistry - Molecules. Chemical Bonds.

B-4

Abs Jour: Ref Zhur-Khimiya, No 5, 1957, 14434

Author : Yu. A. Pentin, V. M. Tatevskiy

Inst :

Title : Energy differences of inverted isomers of certain halogeno derivative hydrocarbons

Orig Pub: Dokl. AN SSSR, 1956, 108, No 2, 290-293

Abstract: With the aim of making a study of inverted isomery in alkyl halides 1,2-dihalogeno derivative hydrocarbons, the following spectra were examined: infra-red, comb. of solutions propylchloride (I), propyl bromide (II), n-butyl bromide (III), isobutyl bromide (IV), 1,2-dichloroethane (V), 1,2-dibromoethane (VI), 1,2-dibromopropane (VII). Infra-red spectra (in the region of 400-1500  $\text{cm}^{-1}$ ) were examined in solid, liquid and gaseous states, and the comb. of solutions spectra - in the liquid phase at various temperatures. The relation of frequencies to the trans- or turned inverted isomers was checked by an examination of the

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*Moscow State U.*

- bands and

USSR/Physical Chemistry - Molecules. Chemical Bonds.

Abs Jour: Ref Zhur-Khimiya, No 5, 1957, 14434

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Abstract: the distribution of the C atoms removed from the halogen, so that the isomers decompose into 2 groups, in each of which the C-Hal frequency is practically identical. It was shown, that the experimentally determined value  $\Delta U$  represents the arithmetical mean value of the energy differences of isomers which belong to these two groups. An equation is also obtained which ties in the observed relation of intensities with the energy differences of all isomers of both groups, which thus may be determined in principle if the intensity relationships are measured in a sufficiently wide interval of  $\nu$ .

1. ENTIN, Yu. A.

PRIKHOT'KO, A.F.

24(7)

p 3

PHASE I BOOK EXPLOITATION SOV/1365

L'vov. Universitet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Fizichnyy zbirnyk, vtp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Jazer, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Lantberg, G.S., Academician (Resp. Ed., Deceased), Neporent, B.S., Doctor of Physical and Mathematical Sciences, Pabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Fabrikant, V.A., Doctor of Physical and Mathematical Sciences, Kornitskiy, V.G., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Miliyanovich, V.S., A. Ye., Candidate of Physical and Mathematical Sciences, and Glauberman, A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

Entin, Yu. A., V.M. Tatevskiy, and B.A. Pozdyshev. Study of Rotational Isomerism by Means of Spectroscopy

300

Kovalev, I.P. Vibrational Spectra and Potential Energy Constants of Monosilane and Its Deuteroderivatives

304

Veyts, I.V., and L.V. Gurvich. Energy Dissociation and Basic Electron States of Alkali Earth Metal Oxides

305

Yakovleva, A.V., and I.I. Gromova. Nitrogen Fluorescence Under the Influence of Short-wave Radiation

308

Dianov-Kokov, V.I. Absorption Spectra of Liquid Oxygen

310

Koronkevich, V.P. Experimental Determination of Coefficients of the Dispersion Formula for Normal Air

*Pentin, Yu. A.*

AUTHORS: Pozdyshev, V. A., Pentin, Yu. A. and Tatevskiy, V. M. 51-3-3/14

TITLE: Infrared Spectra of Absorption by Certain Halogenated Alkanes in Liquid and Solid States and the Problem of Number and Configuration of Rotational Isomers.  
(Infrakrasnyye spektry pogloshcheniya nekotorykh galoidalkanov v zhidkom i tverdom sostoyaniyakh i vopros o chisle i konfiguratsiyakh povorotnykh izomerov.)

PERIODICAL: Optika i Spektroskopiya, 1957, Vol.III, Nr.3, pp.211-220.  
(USSR)

ABSTRACT: At low temperatures concentrations of certain isomers are so small that their spectral lines or bands disappear. A "freezing" method based on this effect (Refs.1, 2, 3) was used by the present authors for comparison of infrared spectra of absorption by liquids and frozen substances. The results obtained were used to find the number, configuration and relative stability of rotational isomers in certain fairly complex halogenated alkanes.

Card 1/4 The following substances were studied: (1) 1,2-dichloroethane,

51-3-3/14

Infrared Spectra of Absorption by Certain Halogenated Alkanes in Liquid and Solid States and the Problem of Number and Configuration of Rotational Isomers.

(2) propyl chloride, (3) 1,2-dibromopropane, (4) 1,2-dibromobutane, (5) isobutyl bromide, (6) isoamyl bromide, (7) 1,4-dibromobutane. Infrared absorption spectra of these substances were obtained for the region of 450 to 1500  $\text{cm}^{-1}$ . In freezing of the liquids the lowest temperature used was about  $-175^{\circ}\text{C}$ . Figs. 2 & 3 show spectra of the substances studied in liquid and solid state respectively. For 1,2-dichloroethane three  $\text{C}_{2h}$  rotational forms were found and two  $\text{C}_2$  forms. In the solid state only one  $\text{C}_{2h}$  form remains. Rotational isomeric configurations of propyl-chloride are two in number ( $\text{C}_3$  and  $\text{C}_1$  forms). In the solid state only one trans-form remains in propyl chloride. The 618  $\text{cm}^{-1}$  frequency was difficult to interpret. Infrared spectra of the liquid and crystalline states of isobutyl bromide were identical. The authors conclude that either  $\text{C}_3$  and  $\text{C}_1$  configurations exist both in the

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51-3-3/14

Infrared Spectra of Absorption by Certain Halogenated Alkanes in Liquid and Solid States and the Problem of Number and Configuration of Rotational Isomers.

liquid and solid states, or only one configuration exists in both states. The authors find themselves unable to decide this point. For 1,2-dibromopropane three rotational isomers were suggested. Again no difference between the liquid and solid-state spectra was observed. The 1138  $\text{cm}^{-1}$  frequency, which is more intense in the solid state, is assigned to the trans-distribution of bromine atoms, the 1228 and 1203  $\text{cm}^{-1}$  frequencies are assigned to the two other isomers. Molecules of isoamyl bromide and 1,2-dibromobutane have each two C-C bonds which permit rotational isomerism. In both these substances two rotational isomeric configurations are observed, both of which are stable in liquid and solid states. For 1,4-dibromobutane six theoretical configurations of the liquid state are shown in Fig. 5. In the crystalline state of this substance only one isomer remains which has a mirror-rotational axis of the

Card 3/4

POZDISHEV, V.A.; PENTIN, Yu.A.; TATEVSKIY, V.M.

Kinetics of the rotation isomerization reaction. Vest. Mosk. un.  
Ser. mat., mekh., astron., fiz. khim., 12 no.5:221-226 '57.

(MIRA 11:9)

1. Laboratoriya molekulyarnoy spektroskopii Moskovskogo gosudarstvennogo  
universiteta.

(Isomerization)

*Pentin, Y.M.*  
PENTIN, Yu.A.; TATEVSKIY, V.M.

Possibility of spectroscopic determination of the difference in energies of rotation isomers of complex molecules [with summary in English]. Zhur.fiz.khim.31 no.8:1830-1838 Ag '57. (MIRA 10:12)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.  
(Isomers--Spectra) (Molecules--Spectra)

*Pentin, Yu. A.*

USSR/Physical Chemistry - Kinetics, Combustion, Explosions, Topochemistry,  
Catalysis.

B-9

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3844.

Author : V.A. Pozdyshev, Yu. A. Pentin, V.M. Tatevskiy.

Inst : Academy of Sciences of USSR.

Title : Kinetics of Rotamerism Reactions.

Orig Pub: Dokl. AN SSSR, 1957, 114, No 3, 583-585.

Abstract: The activation energy  $E(\text{act})$  of the reaction cis-isomerism  $\leftarrow$  trans-isomerism of  $\text{C}_3\text{H}_7\text{Cl}$  was found to be equal to 4800 cal per mole based on the study of the reaction kinetics of  $\text{C}_3\text{H}_7\text{Cl}$  rotamerism in solid state. Rotamerism was observed spectroscopically by the intensity decrease of the band  $1310\text{ cm}^{-1}$  of the outer deformation vibration of the group  $\text{CH}_2$ . Should the magnitude of the height difference of potential wells, determined by the temperature dependence of the relative band intensity in the infrared

Card : 1/2

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PENTIN, Yu. A.

Yu. A. Pentin, "The connection between the phenomenon of crystallization of organic compounds and the rotational isomerism."

report presented at the Symposium on Concepts of Conformation in Organic Chemistry which took place in Moscow at the IOKh AN SSSR (Institute of Organic Chemistry, AS USSR) from September 30 to October 2, 1958.

Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1959, No. 3, 561-564.

PENTIN, Yu. A.

V. M. Tatevskiy, Yu. A. Pentin, Ye. G. Treshchova, and Kh. Kesler,  
"Rotational Isomerism and the Energy of the Formation of Hydrocarbons."

report presented at the Symposium on Concepts of Conformation in Organic Chemistry which took place in Moscow at the IOKh AN SSSR (Institute of Organic Chemistry, AS USSR) from September 30 to October 2, 1958.

Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1959, No. 3, 561-564.

PENTIN, Yu. A. (Moscow)

Yu. A. Pentin, "Investigation of the Rotational Isomerism of Hydrocarbon Halogen Derivatives by Spectroscopic Methods."

report presented at the Symposium on Concepts of Conformation in Organic Chemistry which took place in Moscow at the IOKh AN SSSR (Institute of Organic Chemistry, AS USSR) from September 30 to October 2, 1958.

Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1959, No. 3, 561-564.

PENTIN, YU. A.

75-1-20/32

AUTHORS: Dombrovskaya, U. , Pentin, Yu. A. , Dombrovskiy, Yu., Tatevskiy, V. M. , Kochetkov, N. K.

TITLE: The Investigation of the Tautomerism of the Alkyl- $\beta$ -Aminovinyl Ketones According to Infrared Absorption Spectra (Issledovaniye tautomerii alkil- $\beta$ -aminovinilketonov po infrakrasnomu spektru pogloshcheniya)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1956, Vol. 32, Nr 1, pp. 135-140 (USSR)

ABSTRACT: The present work is directly connected with earlier works (reference 1 and 2). The investigations in these works referred to the clarification of the question of the existence of enamine-imide-tautomerism. The present work is also devoted to the same question. The spectra obtained experimentally are discussed here and compared with each other. 1) The range 2800 - 3500  $\text{cm}^{-1}$ , of the valence-X-H-oscillations. In the spectrum of the solid alkyl- $\beta$ -aminovinyl ketone, i.e. in the  $\alpha$ -form of the substance absorption bands with 3140 and 3222  $\text{cm}^{-1}$  corresponding to the oscillations of the OH group, are present. It is shown that the  $\alpha$ -form is a more or less pure imide-enol form. 2) The range 1450 - 1700  $\text{cm}^{-1}$  of the double bonds. All data obtained here speak in favour of the fact that the  $\alpha$ -form corresponds

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76-1-20/32

The Investigation of the Tautomerism of the Alkyl- $\beta$ -Aminovinyl Ketones According to Infrared Absorption Spectra

to the imide-enol form, and that the transformation product of the  $\alpha$ -form and the mixture of the  $\alpha$ - and  $\beta$ -form represents a mixture of the imide-enol- and of the enamine-ketone-form. 3) The range  $700 - 1450 \text{ cm}^{-1}$ . In the spectrum of the mixture of the  $\alpha$ - and  $\beta$ -forms of the methyl- $\beta$ -aminovinyl ketone  $1250 -$  and  $1002 \text{ cm}^{-1}$  bands are present, which were not observed in the spectrum of the  $\alpha$ -form and are characteristic for the enamine-ketone-form. Generally, an interpretation of the bands of this range is very difficult. 4) The range  $400 - 700 \text{ cm}^{-1}$ . In the spectrum of the mixture of  $\alpha$ - and  $\beta$ -forms of homologues of the alkyl- $\beta$ -aminovinyl ketones wide bands with an absorption centre  $\sim 650 \text{ cm}^{-1}$  are present. These bands become essentially more intensive in the spectra of the  $\alpha$ -form. It is assumed that these ones correspond to the deformation oscillations of the hydroxyl group of the imide-enol-form. It may be assumed that the conclusions drawn with respect to the other ranges also apply for this range. Summing up it is proved on the base of the infrared absorption spectra (in the range of  $400 - 3500 \text{ cm}^{-1}$ ) of the methyl- $\beta$ -aminovinyl ketone, of its homologues and of some model-compounds in different physical states that the alkyl- $\beta$ -aminovinyl ketones exist in tautomeric forms; viz. as an enamine-ketone-form (A) and as an

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75-1-20/32

The Investigation of the Tautomerism of the Alkyl- $\beta$ -Aminovinyl Ketones According to Infrared Absorption Spectra

imide-enol-form (B). There are 1 figure, and 15 references, 6 of which are Slavic.

ASSOCIATION: Moscow State University imeni M. V. Lomonosov  
(Moskovskiy gosudarstvenny universitet im. M. V. Lomonosova)

SUBMITTED: October 24, 1956

AVAILABLE: Library of Congress

Card 3/3

Y. A. PENTIN, V. A. ZIBOROV, V. A. PENTIN;  
 and V. M. TATCHEV (M. V. Lomonosov State Univ.,  
 Moscow). Zhur. Fiz. Khim. 32, 707-9 (1958).--A formula  
 was derived for the calcul. of the magnetic susceptibility of  
 hydrocarbons and monosubstituted hydrocarbons and the  
 values of magnetic susceptibilities of 7 hydrocarbons and 17  
 alcs. calcul. by the use of the formula were compared with  
 the available exptl. information. The agreement was very  
 good. W. M. Sternberg

// Distr: 4E1j/4E2c(j)/4E3d/4E4c

7  
 2 May  
 4

**AUTHORS:**

Ziborov, V. A., Pentin, Yu. A.,  
Tatevskiy, V. M.

76-32-3-33/43

**TITLE:**

Letters to the Editor (Pis'ma v redaktsiyu).  
Rules Governing the Mean Magnetic Susceptibility of  
Paraffin Hydrocarbons and Alcohols (Zakonomenosti  
v srednikh magnitnykh vosprimchivostyakh parafinovykh  
uglevodorodov i spirtov)

**PERIODICAL:**

Zhurnal Fizicheskoy Khimii, 1958, Vol. 32, Nr 3,  
pp. 707-709 (USSR)

**ABSTRACT:**

In connection with work performed on types and subtypes of  
hydrocarbon bonds and with corresponding analysis of their  
physicochemical properties a formula is given by which the  
phenomena mentioned in the title can be determined. The  
results of the determinations performed with a series of  
substances are given in a table. They show good agreement  
with the experimentally obtained values. The given scheme  
of calculation is more suitable than Pascal's scheme (and the  
modifications), and moreover does not possess any additive

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Letters to the Editor

Rules Governing the Mean Magnetic Susceptibility of Paraffin  
Hydrocarbons and Alcohols

76-32-3-33/43

constants. The applied theoretical expressions of the stability of the physicochemical quantities (with the nature of a capacity factor) can, according to the results in comparison with the experimental data, be well used. In this manner the importance of the physicochemical properties of organic compounds can be explained and predicted on a much broader basis than it was possible before. There are 2 tables and 8 derivative expressions.

ASSOCIATION:

Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova /  
(Moscow State University named M. V. Lomonosov)

RECEIVED:

October 17, 1956

ATTENTION:  
Card 2/2

AUTHOR: Pentin, Yu. A.

20-119-1-31/52

TITLE: A Scheme for the Calculation of the Physico-Chemical Properties of the Paraffin Derivatives (Skhema rascheta fiziko-khimicheskikh svoystv proizvodnykh parafinovykh uglevodorodov)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 1, pp. 113-116 (USSR)

ABSTRACT: The regularities for several physico-chemical properties of different classes of hydrocarbons can be successfully illustrated by the aid of the conceptions introduced by V.M. Tatevskiy on the types and subtypes of the carbon-carbon- and carbon-hydrogen-bonds. The problem of the applicability of these conceptions in the elaboration of a scheme for calculating the physico-chemical properties of other classes of organic compounds is of great interest. The present paper e.g. investigates the derivatives of the paraffin hydrocarbons by a general formula  $C_nH_{2n+2-m}X_m$ , where X denotes the monovalent substituting group. The author extends the conceptions on the subtypes of the chemical bonds to the compounds to be investigated here and assumes the following:

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# A Scheme for the Calculation of the Physico-Chemical Properties of the Paraffin Derivatives

The properties of the bonds (the same as in the case of the hydrocarbons) are conditioned by the atoms concerned in the formation of these bonds and by the atoms immediately connected to these atoms. After all a physico-chemical property  $P$  of a substance is represented by the numbers of chemical C-C-bonds of the different subtypes and by certain values  $k_l$

$P_{ij}^{kl}$ , which according to the scheme of calculation must have approximately the same values for all compounds of a certain class. These constants at present cannot be theoretically calculated. The formula given here and the conceptions used for its calculation can only be checked by determination of the

value  $P_{ij}^{kl}$  from the experimental values of the physico-chemical property  $P$  for different compounds of the form  $C_nH_{2n+2-m}X_m$  with a given substituent  $X$  or by determination of

$P_{ij}^{kl}$  from the data on any group of compounds of a certain class (and by comparison of the values of  $P$  calculated from it with the experimental values of  $P$  for a different group. of com-

Card 2/3

20-119-1-31/52

A Scheme for the Calculation of the Physico-Chemical Properties of the  
Paraffin Derivatives

pounds . The scheme here discussed so far was only checked by the calculation of a few physico-chemical properties of monoatomic alcohols (  $X-OH$  ). Two diagrams given as an example show the coincidence of the experimental and the calculated values of the molecular volumes and the refraction indices for some alcohols. The possibilities for explaining and calculating the physico-chemical properties of organic compounds are more extensive than so far assumed. This is valid for the number of attainable chemical compounds and also for the group of the physico-chemical properties. There are 2 figures, 1 table, and 3 references, 3 of which are Soviet.

PRESENTED: August 2, 1957, by B. A. Kazanskiy, Member, Academy of Sciences, USSR

SUBMITTED: November 17, 1957

Card 3/3

SOV/51-7-3-4/21

AUTHORS: Kesler, Kh., Pantin, Yu.A., Treshchova, Ye.G. and Tatevskiy, V.M.

TITLE: Investigation of the Infrared Absorption Spectra of Hydrocarbons at Various Temperatures Both in the Liquid and Solid Phases.

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 3, pp 301-310 (USSR)

ABSTRACT: The paper reports a study of the infrared absorption spectra of nine hydrocarbons at temperatures from room temperature (liquid phase) and at low temperatures (solid phase). The study was undertaken to find out the changes in the spectra which occur on solidification. The hydrocarbons studied were normal alkanes (n-heptane, n-octane), branched alkanes (3-methylheptane, 2,3-dimethylheptane, 2,4-dimethylpentane, 2,5-dimethylhexane, 2,2,5,5-tetramethylhexane) and branched alkenes (2-methylheptene-2, 3,3-dimethylheptene-1). All these hydrocarbons were prepared and their properties determined in outside laboratories (acknowledgments are made to Prof. R. Ya. Levina and to A.V. Iogansen in this connection). Table 1 gives the degree of purity, the melting and crystallization points and the refractive index at 20°C ( $n_D^{20}$ ) of the nine hydrocarbons listed above. The infrared spectra were recorded in the region from 700 to 1800  $\text{cm}^{-1}$  by means of a two-beam infrared spectrometer IKS-2 with a NaCl prism. The optical slit width was 7-10  $\text{cm}^{-1}$ .

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Investigation of the Infrared Absorption Spectra of Hydrocarbons at Various  
Temperatures Both in the Liquid and Solid Phases

SOV/51-7-3-4/21

For liquids, cells with effective layer thickness from 0.03 to 0.48 mm were used. At low temperatures a special cell was employed; its construction ensured the constancy of the layer thickness of a liquid or solid in it. Measurements were carried out at temperatures from +20°C to -172°C. In order to obtain good crystals and to avoid vitrification, the hydrocarbons were cooled slowly. Figs 1-3 show absorption spectra of the nine hydrocarbons at various temperatures. Tables 2-4 give the observed absorption maxima for the liquid and solid phases. The results obtained show that in the case of 2,4-dimethylpentane and 2,5-dimethylhexane only one (the most symmetrical) isomer exists in the crystal phase, but more than one rotational isomer is present in the liquid phase. The authors suggest that only those substances crystallize out which have one rotational isomer of sufficiently high symmetry necessary to form a correct molecular crystal lattice. There are 3 figures, 4 tables and 10 references, 3 of which are Soviet and 7 English.

SUBMITTED: November 26, 1958

Card 2/2

PENTIN, Yu.A.; KUZ'YANTS, G.M.; UL'YANOVA, O.D.

Difference in the conformation energy of liquid trans-1,2-  
dibromocyclohexane. Zhur. fiz. khim. 38 no.5:1302-1303  
My '64. (MIRA 18:12)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.  
Submitted June 3, 1963.

L 31185-66 EWP(j)/EWT(m) RM

ACC NR: AF6022543

SOURCE CODE: UR/0189/66/000/001/0003/0005

AUTHOR: Pentin, Yu. A.; Rudakova, S. Ye.

ORG: Department of Physical Chemistry, Moscow State University (Kafedra fizicheskoy khimii Moskovskogo gosudarstvennogo universiteta)

TITLE: Vibrational spectra of ethylchlorosilanes III. Ethyldichlorosilane

SOURCE: Moscow. Universitet. Vestnik. Seriya II. Khimiya, no. 1, 1966, 3-5

TOPIC TAGS: spectrum, Raman spectrum, vibration frequency, chlorinated organic compound

ABSTRACT: An infrared spectrum and a Raman spectrum of  $C_2H_5SiHCl_2$  in the liquid and in the solid states were recorded. When data was used in calculating frequencies of normal oscillations of  $C_2H_5SiHCl_2$ , the changes in spectra upon solidifying of the compound are accounted by the "freezing" of the gauche-form. The authors thank V. V. Korobov (deceased) for supplying the material. Orig. art. has: 2 figures and 1 table. [SPRS]

SUB CODE: 20, 07/ SUBM DATE: 26Mar65/ ORIG REF: 005/ OTH REF: 002

Card 1/1 (U)

UDC: 539.19 + 541.57

0915

0552

L 64702-65 EWT(m)/EPI(c)/EWP(j) RM

ACCESSION NR: AR5012271

UR/0058/65/000/003/EO44/DO44

SOURCE: Ref. zh. Fizika, Abs. 3D337

AUTHOR: Panchenko, Yu. N.; Pentin, Yu. A.

TITLE: Investigation of butadi-1,3-ene by infrared spectroscopy

CITED SOURCE: Tr. Komit. po spektroskopii. AN SSSR, vyp. 1, 1964, p. 100

TOPIC TAGS: spectrographic analysis of spectra

TRANSLATION: A number of bands shift and change intensity in the infrared spectrum of butadi-1,3-ene. The shift of the bands is observed in the solid phase.

phase is produced. The Christiansen filter effect was observed for one of the absorption bands.

SUB CODE: OP

ENCL: 00

Cord 1/1

DZHESSATI, S.; TYULIN, V.I.; PENTIN, Yu.A.

Rotational isomers of an isoprene molecule. Zhur. struk. khim. 6  
no.3:465-467 My-Je '65. (MIRA 18:8)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.

RUDAKOVA, S.Ye.; PENTIN, Yu.I.

Vibrational spectra of chlorosilanes. Part 1. Opt. i spektr. 18  
no.42592-598 Ap 1956 (MIRA 18:8)

PENTIN, Yu.A.; BELETSKAYA, I.P.; PRAYSNAR, B.; REUTOV, O.A.

Infrared and ultraviolet spectra of organomercury compounds. Report No.1;  
Infrared spectra of benzyl mercury halides. Izv. AN SSSR. Ser. khim. no.7;  
1180-1188 '65. (MIRA 18:7)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.

PENTIN, Yu.A., kand. Khim. nauk

Internal rotation and structure of molecules. Priroda 52  
no.11:64-69 '63. (MIRA 17:1)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.

VINOKUROV, V.G.; TROITSKAYA, V.S.; GRANDBERG, I.I.; PENTIN, Yu.A.

Pyrazoles. Part 39: Structure and tautomerism of hydroxypyrazoles  
Zhur. ob. khim. 33 no.8:2597-2605 Ag '63. (MIRA 16:11)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

BEREZIN, I.V.; KAZANSKAYA, N.F.; PENTIN, Yu.A.

Steric structure and reactivity of the C-H bonds of  
2,2,4-trimethylpentane. Zhur. fiz. khim. 38 no.1:125-129  
Ja'64. (MIRA 17:2)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

PENTIN, Yu.A.

On some schemes for calculating the energy differences of  
rotational isomers. Zhur. fiz. khim. 37 no.9:2106-2113 S '63.  
(MIRA 16:12)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

ACCESSION NR: AP4011444

S/0076/64/038/001/0125/0129

AUTHORS: Berezin, I. V. (Moscow); Kazanskaya, N. F. (Moscow);  
Pentin, Yu. A. (Moscow)

TITLE: Spatial structure and reactivity of the C-H bonds in 2,2,4-trimethylpentane

SOURCE: Zhurnal fiz.khim, v. 38, no. 1, 1964, 125-129

TOPIC TAGS: trimethylpentane, C-H bonds, spatial structure, C-T bonds

ABSTRACT: Using tritium tagging, the relative activity of different C-T bonds in a 2,2,3-trimethylpentane molecule was investigated. The results of this study indicate that the molecules of this compound at 60-90C are in the form of a conformation isomer where the C-H bond of the tertiary carbon atom is strongly screened. During the study, the rate constant of the methyl radical interaction with the C-T bond of the 2,2,4-trimethylpentane tagged in certain position, and the ratio of this rate to the rate constant of its interaction with the whole

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ACCESSION NR: AP4011444

molecule (equal to the ratio of specific radioactivity of methane formed in the reaction to the specific radioactivity of the initial hydrocarbon), as well as the temperature dependence of this ratio, were measured. By determining the C-T reactivity and making some assumptions, the C-H reactivity could be evaluated. In the course of this work, 2,2,4-trimethylpentane-4-T and -3-T were synthesized, and their infrared spectra were recorded with a UR-10 spectrometer. The spectra of combined diffusion were also recorded with DFS-12 spectrometer. It was concluded that 2,2,4-trimethylpentane both in the liquid and crystalline states exists in a single conformation state. Orig. art. has 3 Figures, 1 Table.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 25Mar63

DATE ACQ: 14Feb64

ENCL: 00

SUB CODE: CH

NR REF SOV: 009

OTHER: 005

Card 2/2

KOTOV, Yu.I.; KOPTEV, G.S.; PENTIN, Yu.A.; TATEVSKIY, V.M.

Infrared absorption spectrum of deuterated hydrazine vapors.

Opt. 1 spektr. 15 no.4:564-565 0 '63.

(MIRA 16:11)

PENTIN, Yu.A.; SHARIPOV, Z.

Spectroscopic study of the rotational isomerism of allyl bromide and methallyl chloride. Vest.Mosk. un. Ser.2: Khim.18 no.4:30-35 J1-Ag '63. (MIRA 16:9)

1. Kafedra fizicheskoy khimii Moskovskogo universiteta.  
(Propene—Spectra) (Isomerism)

MELIKHOVA, L.P.; PENTIN, Yu.A.; UL'YANOVA, O.D.

Spectrescopic study of the rotational isomerism of some halo derivatives of butane. Zhur.strukt.khim. 4 no.4:535-540 J1-Ag '63.

(MIRA 16:9)

1. Moskovskiy gosudarstvennyy universitet.  
(Butane—Spectra) (Isomerism)

PENTIN, Yu.A.; SHARIPOV, Z.; KOTOVA, G.G.; KAMERNITSKIY, A.V.; AKHREM, A.A.

Spectroscopic investigation of the conformation equilibrium of  
chlorocyclohexane and bromocyclohexane. Zhur.strukt.khim. 4  
no.2:194-200 Mr-Apr '63. (MIRA 16:5)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.  
(Cyclohexane—Spectra)

PENTIN, Yu. A.; TRUBNIKOV, I. S.; TEPLINSKAYA, R. B.; SHUSHERINA, N. P.;  
LEVINA, R. Ya.

Infrared spectra and structure of  $\beta$ -keto acids. Izv. AN SSSR.  
Ser. fiz. 27 no.1:55-58 Ja '63. (MIRA 16:1)

1. Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova.

(Acids, Organic--Spectra)

L 16202-83  
ACCESSION NR: AP3006628

EPF(c)/EWT(m)/BDS Fr-4 RM/WV/JW  
8/0076/63/037/009/2106/2113

AUTHOR: Pentin, Yu. A.

TITLE: Some schemes for calculating the energy differences of molecular rotation isomers

SOURCE: Zh. fizicheskoy khimii, v. 37, no. 9, 1963, 2106-2113

TOPIC TAGS: rotational isomer energy, rotation isomer energy, rotational isomer energy difference, X substituted alkane molecules, alkane molecule, molecule derivative, alkane molecule, bonding energy method application

ABSTRACT: Some schemes for calculating the energy differences of the rotation isomers of X-substituted alkane molecules of the  $C_nH_{2n+2-m}X_m$  type were investigated analytically and compared with available experimental data. It was found that 1) a method of representing the energy of formation of any other physicochemical property of alkanes and their derivatives as the sum of energies of interacting pairs of atoms in Bernstein's classification is

Card 1/2

L 16202-53

ACCESSION NR: AP3006628

very limited and cannot be used for calculating energy differences and potential barriers of rotation isomers; 2) the formation energy of alkane molecules and their derivatives can be better evaluated with an approximation in the form of a sum of the various bonding energies, which gives a qualitatively correct evaluation of the energy differences of rotation isomers for homologs; and 3) the bond-energy method shows promise for assessing the energy differences of rotation isomers of complex molecules from data on the energy differences of the rotation isomers of the corresponding simple molecules. "The author thanks Professor V. M. Tatevskiy for his discussion pertaining to the article." Orig. art. has: 3 figures, 4 formulas, and 2 tables.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 13Nov62

DATE ACQ: 30Sep63

ENCL: 00

SUB CODE: CH

NO REF SOV: 014

OTHER: 007

Card 2/2

TRUBNIKOV, I.S.; TEPLINSKAYA, R.B.; PENTIN, Yu.A.; SHUSHERINA, N.P.;  
LEVINA, R.Ya.

Absorption spectra and structure of keto acids in solutions. Zhur.ob.  
khim. 33 no.4:1210-1214 Ap '63. (MIRA 16:5)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.  
(Acids, Organic—Spectra) (Ketones)

PANCHENKO, Yu. N.; PENTIN, Yu. A.; TYULIN, V. I.; TATEVSKIY, V. M.

Raman spectrum of liquid 1,3-butadiene. Opt. i spektr. 13  
no.6:857-859 D '62. (MIRA 16:1)

(Butadiene) (Raman effect)

PENTIN, Yu.A.; TRUHNIKOV, I.S.

Ring-chain tautomerism. Absorption spectra and structure of  
ketols in solutions. Dokl. AN SSSR 146 no.1:107-110 S '62.  
(MIRA 15:9)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.  
Predstavleno akademikom A.N. Nesmeyanovym.  
(Tautomerism) (Ketols—Spectra)

TRUBNIKOV, I.S.; PENTIN, Yu.A.

Infrared spectra and structure of ketols. Zhur.ob.khim.  
32 no.11:3590-3595 N '62. (MIRA 15:11)

1. Moskovskiy gosudarstvennyy universitet imeni  
M.V. Lomonosova.

(Ketols--Spectra)

PENTIN, Yu.A.; TATEVSKIY, V.M.

Study of the internal rotation and rotational isomerism (conformations)  
of molecules by spectroscopic methods. Izv. AN SSSR.Ser.fiz. 26  
no.10:1241-1246 0 '62. (MIRA 15:10)  
(Molecular rotation) (Isomerism) (Spectrum analysis)

S/051/62/013/006/015/027  
E039/E120

AUTHORS: Panchenko, Yu.N., Pentin, Yu.A., Tyulin, V.I., and  
Tatevskiy, V.M.

TITLE: The Raman spectrum of liquid 1 - 3 butadiene

PERIODICAL: Optika i spektroskopiya, v.13, no.6, 1962, 857-859

TEXT: Previous work on the subject is reviewed and the Raman spectrum investigated to elucidate the possibility of relating the weak lines to the second isomer form. Spectra are obtained on ДФС-12 (DFS-12), DFS-4 and ИСП-67 (ISP-67) spectrometers using photographic and photoelectric recording. The 4358 Å line is used for excitation. Two samples of 1-3 butadiene are used, one 97.8% pure (impurity: butane ~2%) and the other 99.7% (impurities: trans-butane 2 ~0.27% with a trace of cis-butane-2). The data are presented in a table, which also contains the most complete data from the literature. Good agreement is obtained with the results of other authors and the differences which occur are discussed in detail. New lines of low intensity are observed in the Raman spectrum of liquid 1-3 butadiene at 1422, 1505, 1606 and 1658 cm<sup>-1</sup>.

Card 1/2

The Raman spectrum of liquid ...

S/051/62/013/006/015/027  
E039/E120

These had all been observed previously in the infrared spectrum of the liquid, and the  $1658\text{ cm}^{-1}$  line had been found in the Raman spectrum of gaseous 1-3 butadiene. These lines were related to the second isomer form. While it is possible to relate these frequencies it is considered to be premature to attribute them to the second isomer form.

There is 1 table.

SUBMITTED: April 24, 1962

Card 2/2

MELIKHOVA, L.P.; UL'YANOVA, O.D.; PENTIN, Yu.A.

Spectrokinetic determination of the conversion barrier for  
1,2-dichloroethane rotatory isomers. Zhur.fiz.khim. 36  
no.8:1814-1815 Ag '62. (MIRA 15:8)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.  
(Ethane) (Isomers--Spectra)

YUR'YEV, Yu.K.; PENTIN, Yu.A.; REVENKO, O.M.

Infrared absorption spectra of  $\alpha$ -alkylpentamethylene sulfides.  
Neftekhimiia 1 no.2:163-168 Mr-Apr '61. (MIRA 15:2)

1. Moskovskiy gosudarstvennyy universitet.  
(Thiopyran-Spectra)

YUR'UEV, Yu.K.; PENTIN, Yu.A.; Revenko, O.M.; LEBEDEVA, E.I.

2,3-Dialkylpentamethylene sulfides and their infrared absorption spectra. Neftekhimiia 2 no.2:137-143 Mr-Apr '62. (MIRA 15:6)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova, khimicheskii fakul'tet.

(Thiopyran—Spectra)

S/048/62/026/010/004/013  
B101/B186

AUTHORS: Pentin, Yu. A., and Tatevskiy, V. M.

TITLE: Study of internal rotation and of rotational isomerism (of conformations) of molecules by spectroscopic methods

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 10, 1962, 1241 - 1246

TEXT: A survey is given of papers concerning infrared spectroscopic studies of isomeric structures by determining the characteristic frequencies. The agreement of the difference  $\Delta E_{a-e}$  between the energies of axial and equatorial conformations of chloro cyclohexane with the double difference  $2\Delta E_{g-t}$  between the energies of the gauche and trans positions of 2-halogen butane and halogen-substituted propane is specially discussed. Using symbols defined in an earlier paper (Dokl. AN SSSR, 119, 113 (1958)) the following is written down: X-cyclohexane:

$$\Delta E_{a-e} = 2 [\epsilon_{C_2C_2}^1(x_g) - \epsilon_{C_1C_2}^1(x_t)]; \quad 2\text{-X-butane: } \Delta E_{g-t} = \epsilon_{C_2C_2}^1(x_g)$$

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S/048/62/026/010/004/013

B101/B186

Study of internal rotation ...

-  $\mathcal{E}_{C_2C_2^1}(X_t)$ ; X-propyl:  $\Delta E_{g-t}^n = \mathcal{E}_{C_2C_1^1}(X_g) - \mathcal{E}_{C_2C_1^1}(X_t)$ ; where X = halogen, the subscripts denote primary ( $C_1$ ) and secondary ( $C_2$ ) C atoms, the superscripts denote presence ( $C^1$ ) or absence ( $C^0$ ) of a substituting halogen atom. Thus,  $\Delta E_{a-g} = 24E_{g-t}$  holds for X-butane, but not for X-propyl, since in the latter case  $\mathcal{E}_{C_2C_1^1} \neq \mathcal{E}_{C_2C_2^1}$  for both the trans- and gauche-

isomers. There are 3 tables. The most important English-language references are: N. Sheppard, Advances in Spectroscopy, N. Y., Interscience publ., 288, 1959; S. Muzushima, T. Shimanouchi, K. Nakamura, M. Hiyashi, S. Tsuchiya, J. Chem. Phys., 26, 970 (1957); L. J. Bellamy et al., J. Chem Soc., 3704 (1956), 3465 (1958); H. Bernstein, J. Chem. Phys., 20, 263 (1952).

Card 2/2

PENTIN, Yu.A.; TRUBNIKOV, I.S.; TEPLINSKAYA, R.B.; SHUSHERINA, N.P.;  
LEVINA, R.Ya.

Infrared spectra and structure of solid  $\delta$ -ketonic acids. Zhur.ob.-  
khim. 32 no.6:1927-1933 Je '62. (MIRA 15:6)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.  
(Acids, Organic--Spectra)

PENTIN, Yu.A.; TETERIN, E.G.; SHESTERIKOV, N.N.

Infrared spectroscopy method for determining tri-n-butyl phosphate and diisooamyl ester of methylphosphonic acid in solutions of n-paraffinic hydrocarbons and dearomatized kerosine. Zhur.anal.-khim. 17 no.2:239-244 Mr-Ap '62. (MIRA 15:4)  
(Phosphonic acid) (Butyl phosphates--Spectra) (Hydrocarbons)

KROSS, A. [Cross, A.D.]; PENTIN, Yu.A., kand. khim. nauk [translator];  
FILONOVA, A.D., red.; KHOMYAKOV, A.D., tekhn. red.

[Introduction to practical infrared spectroscopy] Vvedenie v  
prakticheskuiu infrakrasnuiu spektroskopiiu. Moskva, Izd-vo  
inostr. lit-ry, 1961. 109 p. (MIRA 15:1)  
(Spectrum, Infrared)

PENTIN, Yu.A.; TRUBNIKOV, I.S.; SHUSHERINA, N.P.; LEVINA, R.Ya.

Study of the structure of  $\delta$ -keto acids by infrared spectroscopy.  
Zhur.ob.khim. 31 no.7:2092-2096 J1 '61. (MIRA 14:7)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.  
(Acids, Organic—Spectra)

PENTIN, Yu.A.; TRUENIKOV, I.S.; TEPLINAKAYA, R.B.; SHUSHERINA, N.P.  
LEVINA, R.Ya.

Structure of  $\delta$ -keto acids. Dokl. AN SSSR 139 no.5:1121-1123  
Ag. 1961. (MIRA 14:8)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.  
Predstavleno akademikom A.N. Nesmeyanovym.  
(Acids, Organic)

PENTIN, Yu.A.; PANCHENKO, Yu.N.; TRESHCHOVA, Ye.G.; SHARIPOV, Z.

Study of the infrared absorption spectra and Raman spectra of  
dipropenyl and diallyl in the liquid and solid phase in re-  
lation to cis-trans isomerism. Opt. i spektr. 10 no. 1:55-  
62 Ja '61. (MIRA 14:1)

(Hexadiene--Spectra)

CHIBISOV, A.K.; PENTIN, Yu.A.

Spectroscopic study of thione-thiol tautomerism. Part I: IR absorption spectra of thiourea, phenylthiourea, *o*-diphenylthiourea, and sym-ciphenylthiourea. Zhur. ob. khim. 31 no.1:11-16 Ja '61.  
(MIRA 14:1)

1. Moskovskiy gosudarstvennyy universitet.  
(Urea--Spectra) (Tautomerism)

CHIBISOV, A.K.; PENTIN, Yu.A.

Spectroscopic investigation of thione-thiol tautomerism. Part 2:  
Ultraviolet and infrared absorption and Raman spectra of solutions  
of thiourea, phenylthiourea, as-diphenylthiourea and sym-  
diphenylthiourea. Zhur. ob. khim. 31 no. 2:359-362 F '61.

(MIRA 14:2)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Leomonosova.  
(Urea--Spectra) (Tautomerism)

S/079/61/031/001/002/025  
B001/B066

AUTHORS: Chibisov, A. K. and Pentin, Yu. A.

TITLE: Spectroscopic Study of Thiono-thiol Tautomerism. I. Infrared Absorption Spectra of Thiourea, Phenyl Thiourea, Asymmetric and Symmetric Diphenyl Thiourea

PERIODICAL: Zhurnal obshchey khimii, 1961, Vol. 31, No. 1, pp. 11 - 16

TEXT: Some of the data published in Refs. 1 - 7 on thiono-thiol tautomerism, which has so far been given little attention are contradictory, and require, owing to their practical importance, additional studies. The reactivity of thiourea and its three phenyl derivatives with respect to thiono-thiol tautomeric conversion was examined by the spectroscopic method. Two tautomeric forms of the thioureide group may be assumed

— NH — C = S  $\rightleftharpoons$  — N = C — SH. Tautomeric equilibrium usually appears in solutions, but the existence of different forms is also possible in the crystalline state. The molecules of thiono and thiol forms may be assumed not only to react with those of the solvent but also with one another, forming associates via the hydrogen bonds of the types:

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Spectroscopic Study of Thiono-thiol Tautomerism. S/079/61/031/001/002/025  
 I. Infrared Absorption Spectra of Thiourea, B001/B066  
 Phenyl Thiourea, Asymmetric and Symmetric Di-  
 phenyl Thiourea

$>NH \dots S<; >NH \dots N<; -SH \dots N<; -SH \dots S<.$

The present paper examines the infrared spectra of thio-, phenyl thio-, and diphenyl thiourea (asymmetric and symmetric) in crystalline state and in solution ( $CCl_4$ ) by means of an improved single-beam MKC-11 (IKS-11) infrared spectrometer. The crystalline products for spectrum analysis were prepared in three ways: a) crystallization from high-volatility solvent on a salt lamella, b) suspension in vaseline oil, c) sublimation. The infrared absorption spectra of the above initial ureas in crystalline state in the range of  $3500 - 500 \text{ cm}^{-1}$ , and in dilute solution in  $CCl_4$  in the range of  $3550 - 2800 \text{ cm}^{-1}$  were studied and interpreted. In crystalline state, the molecules of the products studied disclose only the thiono form. A comparison of the infrared spectra of these compounds with the spectra of their solutions in  $CCl_4$  indicates the existence of strong intermolecular hydrogen bonds in the crystalline state. No bands of the C-N-thiol form or of the C-S stretching vibrations of the phenyl derivatives could be found in the spectra of these compounds (Diagram D). The presence of an

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Spectroscopic Study of Thiono-thiol Tautomerism. I. Infrared Absorption Spectra of Thiourea, Phenyl Thiourea, Asymmetric and Symmetric Diphenyl Thiourea..

S/079/61/031/001/002/025  
B001/B066

appreciable quantity of a thiol form of the molecules of thiourea and its phenyl derivatives could not be confirmed in the spectrum region of 1650 - 500  $\text{cm}^{-1}$  (Diagram 1); the thiol form might appear only in a negligible amount. I. I. Levkoyev is thanked for furnishing the initial substances. There are 2 figures and 9 references: 3 Soviet, 1 US, 2 British, 2 German, and 1 Indian.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: October 28, 1959

Card 3/3

KESLER, Kh; PENTIN, Yu.A.; TRESHCHOVA, Ye.G.; TATEVSKIY, V.M.

Investigation of liquid and solid phase infrared absorption spectra  
of hydrocarbons at various temperatures.. Opt. i spektr. 7 no.3:301-  
310 S '59. (MIRA 13:3)

(Hydrocarbons--Spectra)

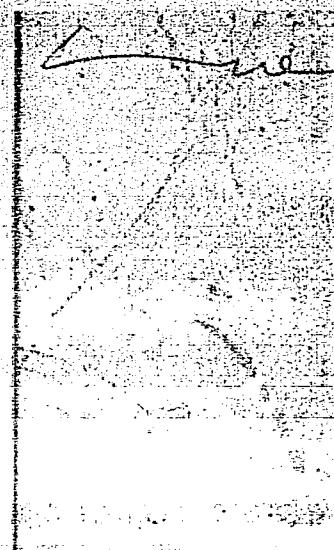
PANCHENKO, Yu.N.; PENTIN, Yu.A.; TYULIN, V.I.; TATEVSKIY, V.M.

Vibration spectra of 1,3-D<sub>6</sub>-Butadiene. Opt. i spektr.  
16 no.6:992-997 Je '64. (MIRA 17:9)

Pen'tina, A. A.

✓ X-ray studies of the structure of copper scale during the last stages of oxidation in air. V. P. Arkharov and A. A. Pen'tina. *Tr. Akad. Nauk S.S.S.R., Ser. Fiz. Khim. i Mekh.* 1955, No. 16, 117-22. Hollow cylinders made of 99.95% Cu, 0.04 S, and 0.01% Al with a wall 0.45 mm. thick were heated in air at 850 and 1000° for 1/2-67 hrs. and the scale formed was investigated to show the mechanism of scale formation after the free metal is oxidized. As long as metallic Cu is still present, diffusion of Cu outwards and of O inwards continues, resulting in a thin CuO layer and a thick coarse-grained one of Cu<sub>2</sub>O. Cu atoms traveling in Cu<sub>2</sub>O faster than O atoms. When the metal is gone, the CuO layer begins to grow at the expense of the Cu<sub>2</sub>O phase with a simultaneous increase of the grain size of the former with (010) plane parallel to the surface. The perfection of cryst. structure increases with a longer oxidizing treatment: after consumption of Cu for about 20 hrs. after which crystals of CuO become smaller and the structure is less distinct. On a still longer oxidation, traces of a new structure appear and the grain size increases.

of



KARLINA (PEN'TINA), A. A. Cand Phys-Math Sci -- (diss) "Study of inter-crystallite diffusion and ~~of~~ the effect of mutual orientation of crystallites upon the adsorptive heterogeneity of <sup>of</sup> concentration." Sverdlovsk, 1957. 13 pp (Ural Affiliat<sup>a</sup>ed, Acad Sci USSR. Inst of Physics of Metals), 100 copies (KL, 6-58, 99)

PEN'TINA, A. A.

126-3-22/34

AUTHOR: Pen'tina, A. A.

TITLE: Study of the influence of the mutual orientation of the crystallites on phenomena taking place in inter-crystallite groupings. (Issledovaniya vliyaniya vzaimnoy oriyentatsii kristallitov na yavleniya, protekayushchiye v mezhkristallitnykh sochleneniyakh).

PERIODICAL: "Fizika Metallov i Metallovedeniye" (Physics of Metals and Metallurgy), 1957, Vol.4, No.3, pp. 536-539 (U.S.S.R.)

ABSTRACT: Much effort has been spent in recent years on elucidating the influence of the deorientation of the grains on the energy of the transient zones, on the mechanical properties, the diffusion in polycrystalline bodies, adsorption phenomena, corrosion and a number of properties of polycrystals and phenomena taking place in polycrystals. In the laboratory of the author systematic investigation began of phenomena taking place in intercrystallite transient zones (on inter-crystallite boundaries) for mutual orientations of the grouped crystallites. In this paper the techniques are described which are necessary for investigating the influence of the deorientation of adjacent crystallites on intercrystallite diffusion. At first the author deals with growing of a large grain, since for the investigations

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PEN'TINA, A.A.

126-1-10/40

AUTHORS: Arkharov, V. I. and Pen'tina, A. A.

TITLE: Investigation of the influence of mutual orientation of crystallites on phenomena taking place in inter-crystallite groupings. (Issledovaniye vliyaniya vzaimnoy oriyentatsii kristallitov na yavleniya, protekayushchiye v mezhkristallitnykh sochleneniyakh).  
II. Influence of the mutual orientation of the crystallites on the degree of non-uniformity of the distribution of the concentration of horophilic admixtures of antimony in copper. (Vliyaniye vzaimnoy oriyentatsii kristallitov na stepen' neravnomernosti raspredeleniya kontsentratsii gorofil'noy primesi sur'my v medi).

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol.5, No.1, pp. 68-73 (USSR)

ABSTRACT: Part I of this paper "Technique of Investigating the Influence of the Orientation of Neighbouring Crystallites on Intercrystallite Diffusion" was published in Vol.IV, No.3, 1957, pp. 536-539 of this journal. The investigations described in this paper are devoted to the further development of the conceptions on the effect of internal adsorption and distribution of horophilic admixtures on the basis of crystallographically differing

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Investigation of the influence of mutual orientation of crystallites on phenomena taking place in intercrystallite groupings.

II. Influence of the mutual orientation of the crystallites on the degree of non-uniformity of the distribution of the concentration of horophilic admixtures of antimony in copper.

intercrystallite boundaries. In earlier work on investigating the intercrystallite internal adsorption, the general character of the effect was mainly investigated on the basis of the metallographic picture of the frontal diffusion of an indicator component in the alloy which contained the horophilic admixture, i.e. the average effect was investigated of the changes of the crystal lattice parameter of the alloy during variations of the grain size. In this paper the individual concrete boundaries are investigated which group crystallite pairs of definite orientations. The character of the distortions of the intercrystallite grouping (Ref.2) and consequently also the excess energy which causes internal adsorption depend on the character of the mutual orientation. Therefore, the aim of this investigation was to elucidate the quantitative influence of the disorientation of the neighbouring crystallites on the degree of nonuniformity of the concentration

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distribution of horophilic admixtures. Literary data on the influence of disorientation of adjacent crystallites on the boundary energy and intercrystallite diffusion can be summarised thus: it was established that the "surface energy" is dependent on the mutual orientation of grouping crystal grains for disorientation angles not exceeding  $50^\circ$  and that this dependence is characterised by an increase in the excess energy of the intercrystallite zones from zero to maximum for a specific value of the disorientation angle; a dependence was established of the speed of diffusion along intercrystallite boundaries on the disorientation angle of adjacent grains; a dependence was established of the quantity of separations in ageing alloys on  $\Delta\theta$  which also indicates a change in the diffusion speed with changing  $\Delta\theta$ . The problem formulated in this paper was solved by elucidating the quantitative dependence of the speed of the metallographically detected inter-

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II. Influence of the mutual orientation of the crystallites on the degree of non-uniformity of the distribution of the concentration of horophilic admixtures of antimony in copper.

crystallite diffusion of the indicator component (Ag) from the ambience into the alloy (Cu-Sb) which contained a horophilic admixture (Sb) on the disorientation of crystallites grouping along a boundary where diffusion was observed. The selection of these three elements was based on a number of factors including the fact that the assumption of the horophilic nature of Sb relative to copper was confirmed by a number of experimental results. The applied technique of investigation has been described in detail in the previous part of this paper (Ref.1). The initial materials were of high purity, the copper had a 99.99% purity, the antimony had a purity of 99.97%; the investigated Cu-Sb alloy contained 0.25% Sb. The results are described and discussed. The established influence of disorientation of adjacent crystallites on the degree of nonuniformity of metallographically detected intercrystallite diffusion proves that there is a nonuniform distribution of the antimony concentration

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along the zones of grain groupings with differing mutual orientations. The disorientation of neighbouring grains also affects the quantity of horophilic admixtures adsorbed in the microcrystallite transient zone which groups them together. This nonuniformity of the internal adsorption along various intercrystallite boundaries also manifests itself on the nonuniform diffusion of silver in the Cu-Sb alloy. Due to the accelerating influence of the antimony, which is dissolved in the copper, on the diffusion of silver in such a solid solution the nonuniformity of the diffusion of silver in the solution of Cu + 0.25% Sb is less pronounced than during diffusion of silver into pure copper where the nonuniformity is due solely to various magnitudes of the excess energy and intercrystallite groupings with various degrees of grain disorientation. The character of distributions in the intercrystallite zones, which

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Investigation of the influence of mutual orientation of crystallites on phenomena taking place in intercrystallite groupings.

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in them, differs considerably in the case of pure copper from analogous distortions in Cu-Sb alloys, since in the latter case, due to adsorption, the intercrystallite zones contain larger quantities of antimony. The thereby caused changes in the character of the distortions in the intercrystallite zones with a given grain disorientation is apparently the reason for the displacement of the maxima and minima on the curves  $b = f(\Delta\theta)$  for the diffusion of silver into the alloy Cu + 0.25% Sb as compared to diffusion into pure copper. There are 4 figures and 19 references, 5 of which are Slavic.

SUBMITTED: February 18, 1957.

ASSOCIATION: Institute of Metal Physics, Ural Branch of the Ac.Sc., USSR. (Institut Fiziki Metallov Ural'skogo Filiala AN SSSR).

AVAILABLE: Library of Congress.

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PEN'TINA, A.A.

18(7)

(p 7)

PHASE I BOOK EXPLOITATION

SOV/1340

✓Akademiya nauk SSSR. Ural'skiy filial. Institut fiziki metallov /

Voprosy teorii zharoprochnosti metallicheskih splavov (Problems in the Theory of Heat Resistance of Metal Alloys) Moscow, Izd-vo AN SSSR, 1958. 160 p. (Series: Its: Trudy, vyp. 19) 3,500 copies printed.

Eds.: Arkharov, V.I. and Sadovskiy, V.D.; Ed. of Publishing House: Rzhiznikov, V.S.; Tech. Ed.: Novichkova, N.D.

PURPOSE: This book is intended for specialists in the field of physical metallurgy.

COVERAGE: (Abstract of Article 1) The articles in this book constitute reports on extensive studies, conducted between 1949 and 1954 by the Institute of Physical Metallurgy at the Urals Branch of the Academy of Sciences, USSR, and devoted to the development of a general theory of heat resistance. A strong need was felt for such a theory because of insufficient knowledge of the physical mechanism of deformation

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phenomena occurring in materials at high temperatures and the resultant difficulty of explaining the frequent difference in behavior of materials under test conditions and under actual operating conditions. The studies centered around the investigation of two basic assumptions: 1) localization of the processes of high-temperature plastic deformation in the zones of structural heterogeneity in a solid body undergoing deformation 2) internal adsorption of certain dissolved addition agents in the vicinity of these heterogeneities. The combined effect of these two phenomena on the heat resistance of the material is very important, because they are both localized in the same zones of the alloy. Actually, deformation develops in zones where the composition of the alloy, as a result of internal adsorption, is quite different from the average composition of the alloy. Another important factor in this connection is the fact that the effect of internal adsorption depends on previous heat treatment. From this it follows that small additions, frequently even those

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too small to be detected by analysis, may considerably change the heat resistance of the alloy, in varying degrees, depending on the heat treatment. It may be concluded that the main factor determining the heat resistance of a crystal is the interatomic bonds in the lattice, which bonds change according to the composition of the solid solution. The first stage of the investigations has been completed and forms the subject matter of the present collection of papers. Results indicate that the basic assumptions have been verified to a considerable extent. These two phenomena, as related to such heterogeneities as transcrystallite joining in polycrystalline alloys (under specified conditions of deformation) have proved to be of decisive importance and can be used as the basis of a hypothesis on how heat resistance is affected by the localization of deformation and by internal adsorption of addition agents in the vicinity of the more minute structural heterogeneities, i.e., the elements of subcrystallite structure (further work is indicated in this direction). Article 2 of the collection gives an

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extensive treatment of the basis of attack on the problem of heat resistance as investigated at the Institute, together with a detailed discussion of the guiding principle underlying all aspects of the study. Articles 3 and 4 attempt to explain the high adsorbability of small additions of a number of elements (e.g., Mo, W, Nb, Ti, Al, B) in iron-chrome-nickel austenite. Article 4 is concerned specifically with the diffusional mobility of one of the main components of the alloy (nickel) in transcrystallite transition zones, an important characteristic as regards heat resistance, inasmuch as plastic deformation at high temperatures [apparently] proceeds by a diffusion-type mechanism. Confirmation of this hypothesis was obtained by analysis of experimental data on high-temperature stress relaxation. This analysis is the subject of Article 10, whereas Article 9 is directly concerned with experimental work on the measurement of stress relaxation. The correlation between data on the transcrystallite diffusional mobility of nickel and on stress relaxation in the investigated alloys is

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given in Article 11. Article 8 describes methods of measuring high-temperature stress relaxation. Article 5 gives experimental data on the effect of small additions of elements of high internal adsorbability on creep in solid solutions. In this study it is shown that under conditions of low stresses, when the deformation is markedly localized in the transcrystallite transition zones, the adsorption-prone addition agent exhibits a strengthening effect. With high stresses, when the deformation is mainly of the slip type and is distributed throughout the crystallite, internal adsorption of the addition element ceases, but in certain cases of high stress flow. Additional data on this question are given in Articles 6 and 14. Article 7 presents the results of an attempt at experimental microinterferometric confirmation of the occurrence of changes in the distribution of strain in the grain of metal containing small amounts of addition agents. The first small additions produce a marked effect on the deformation, which (with low stresses) is

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localized at the intercrystallite boundaries; the alloy is strengthened. An increase in the amount of the addition agents results in a coarsening of the crystallites, which increase the rate of flow. These results also agree with the basic hypothesis concerning the effect of internal adsorption on heat resistance and supplement the hypothesis with indications of the range of strain conditions under which the adsorption phenomenon plays a significant role. In the course of investigating stress relaxation, an unusual effect was observed in certain alloys, namely "negative relaxation", consisting in the growth of stresses with time, instead of the usual natural decrease. This effect has been explained by assuming that under the conditions of the relaxation test a phase transformation takes place in the material, resulting in a lowering of the specific volume (discussed in Article 12). This effect received further confirmation in the study reported in Article 13. In Article 16 the author examines the possibility of extending the basic idea of these investigations to subcrystallite structural heterogeneities, especially to those which arise and develop in aging. Since the majority of heat-resistant alloys undergo aging, the internal-adsorption phenomenon becomes a problem of great importance.

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ARKHAROV, V.I.; PEN'TINA, A.A.

Investigating the effect of mutual orientation of crystallites on  
the intercrystalline diffusion and internal adsorption. Issl. po  
zharopr. splav. 3:119-139 '58. (MIRA 11:11)  
(Metal crystals) (Diffusion)

RODIONOVA, K.F.; KORCHAGINA, Yu.I.; KARPOV, P.A.; GORENBEYN, I.A.; PENTINA, T.Yu.

Geochemical characteristics of Upper Devonian sediments in some  
areas of Volgograd Province. Trudy VNIGNI no.33:72-116 '62.

(MIRA 18:12)

RODIONOVA, K.F.; KORCHAGINA, Yu.I.; PENTINA, T.Yu.

Some data on oil producing rocks in the Volga-Ural region.  
Sov. geol. 7 no.1:123-129 Ja '64. (MIRA 17:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy geologorazvedochnyy  
neftyancy institut.